



Single-Stage Water Filter with Dual Sand Media Sizes

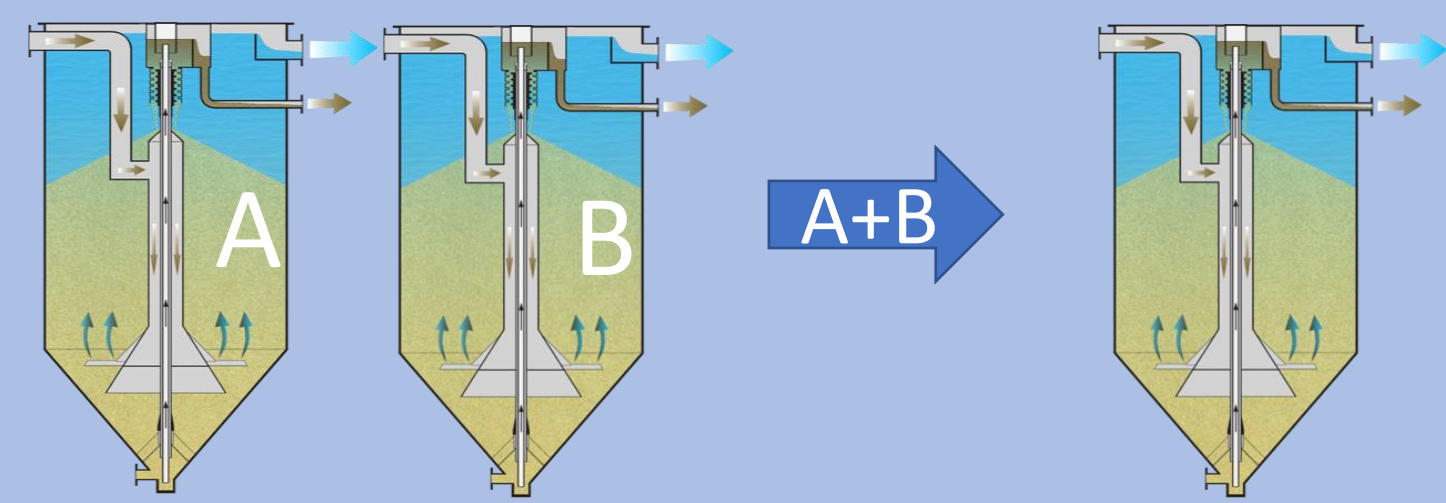
Team Hydration Station: Jaden Cavender, Tobias Flores-Wentz, Benjamin Marek, Tayson Thompson, Blake Urie



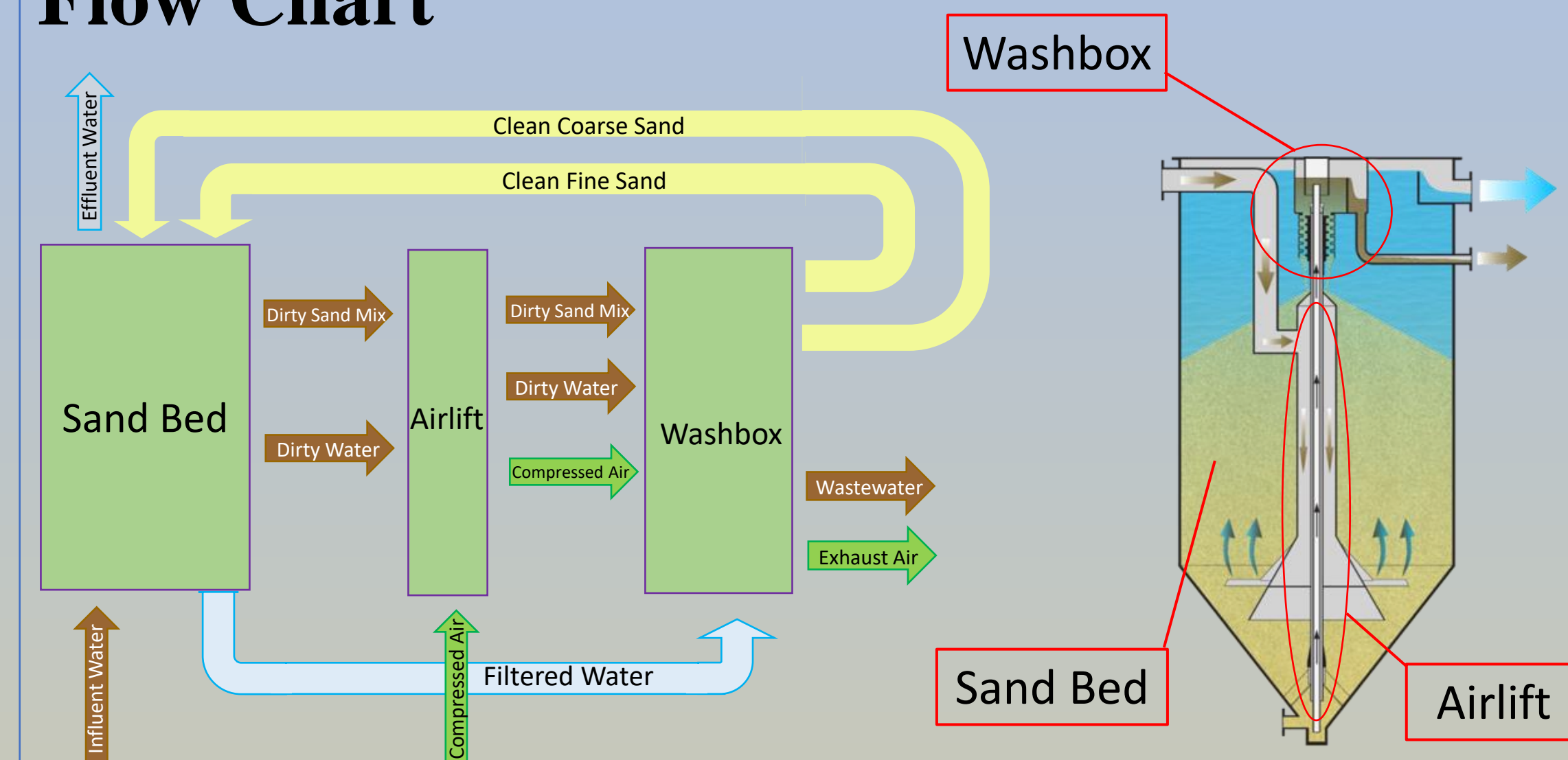
University
of Idaho

Objective

Design a single-stage dual media sand filtration washbox system.



Flow Chart



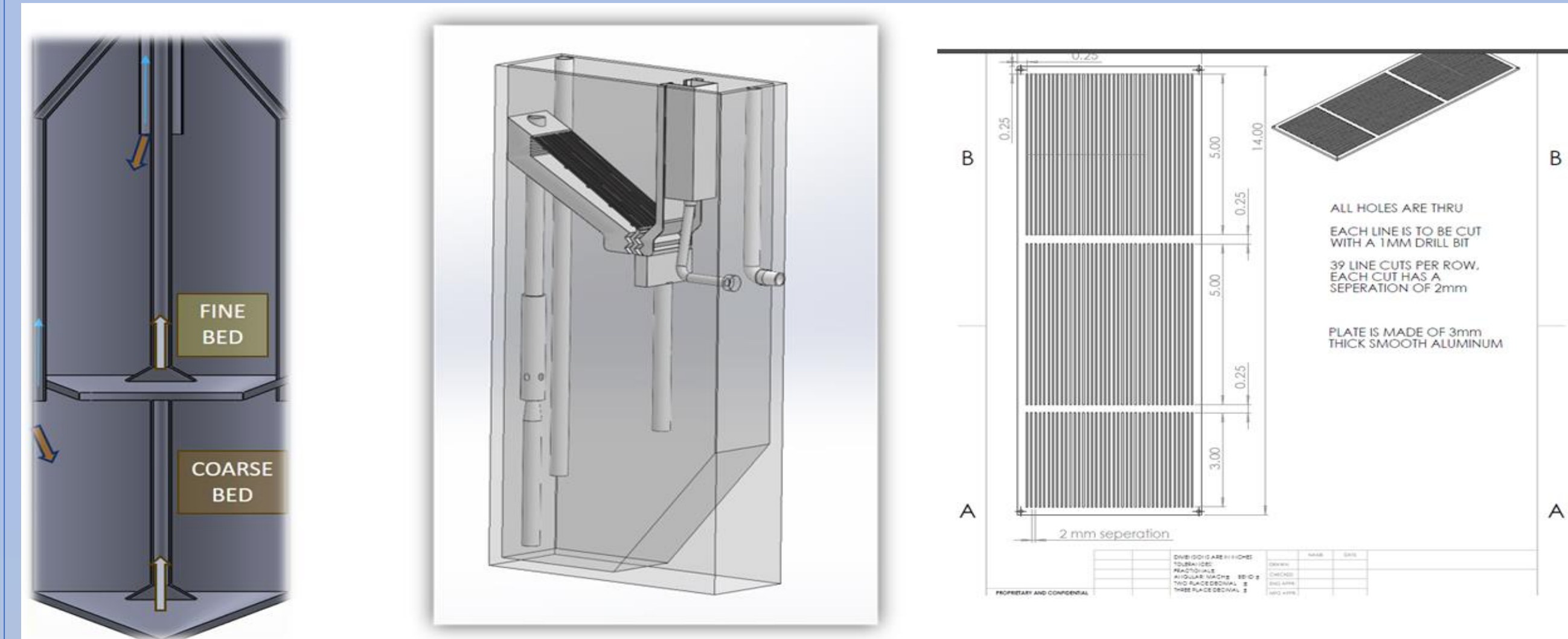
Value Proposition

Clean water is arguably the world's most important resource; therefore, it is vital to invest in water filtration technology. By combining the two-stage filter into a single-stage, we hope to cut back on maintenance and operation costs, while increasing efficiency.

Key Requirements

- Minimum 75% separation of the two sand sizes.
- Chemical and corrosion resistance.
- Minimum upflow rate of 1.8 gallons per minute.
- Maintain a bed turnover rate of 0.7 to 1.4 inches per minute.
- Continuous operation with a maximum of 30 minutes of routine weekly maintenance.

Concept Development



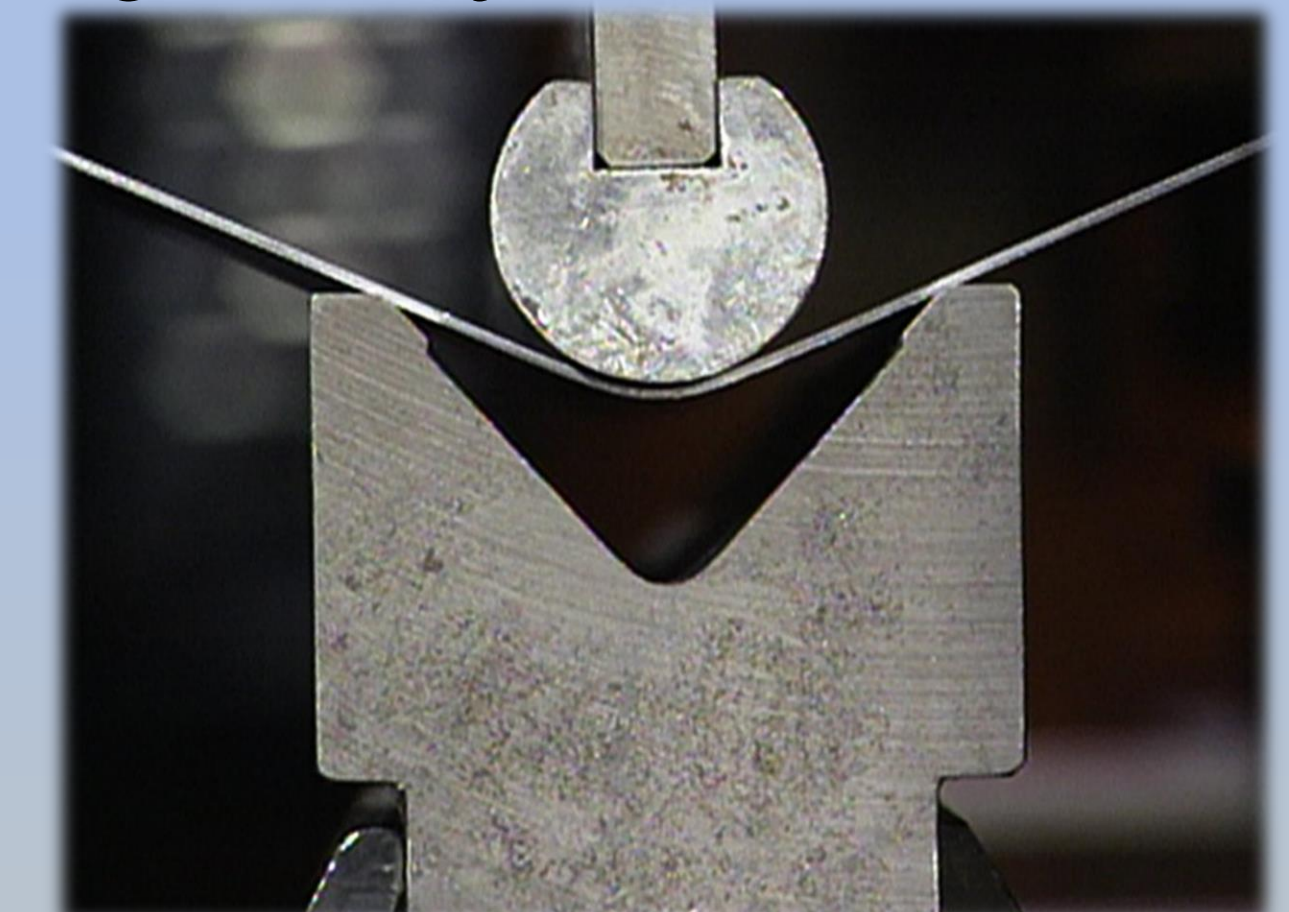
Current Design and Test Stand

- Configurable test stand for rapid prototyping



Design Validation - Manufacturing

- Most parts will be constructed from sheet metal or printed in interlocking sections
- For precision construction of screen meshes, precision tools can be utilized (1mm drills bits, plasma cutting, water jets.)



Current Design Issues

- Assessing wear on components
- Airlift with Dual Inlets
- Achieving 75% sand separation

Project Completion

- Total Suspended Solid test



Acknowledgements

Advisor: Sarah (Xiao) Wu, Ph.D.

Sponsors: Greg Möller, Ph.D.

Mr. Martin Baker

Specifications

Motor: 1/3 hp

Max upflow rate of 8 gpm

Air Compressor: 6 gal capacity

150 psi

Air and influent pipe diameter 3/4 in

Tank Volume: ~ 30 gallons

